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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/595,975	05/23/2006	Hiroichi Ishikawa	09792909-6686	1095

26263 7590 01/21/2010

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EXAMINER	
SMITH, COURTNEY L	

ART UNIT	PAPER NUMBER
2835	

MAIL DATE	DELIVERY MODE
01/21/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/595,975	ISHIKAWA ET AL.	
	Examiner	Art Unit	
	COURTNEY SMITH	2835	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 May 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *05/23/2006, 06/01/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. **Claim 17** is objected to because of the following informalities: 'the heater' is unclear since a heater is not asserted in the base claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claims 1-2, 21-22, and 24-25,** are rejected under 35 U.S.C. 102(b) as being anticipated by **(Glezer 6,588,497).**

Regarding Claims 1 & 24, Glezer discloses a gas ejector **(Fig. 6)** including at least one vibrator **(where synthetic jet module--162 includes two diaphragms 176, 177 with piezoelectric actuators),** comprising: a plurality of ejecting sections **(173, 174--Fig. 7)** adapted for ejecting air in a form of a pulsating flow such that vibration of the vibrator allows sound waves respectively generated upon ejection of the gas to weaken each other **(as set forth by Col. 11, lines 25-35--where synthetic jet actuators oscillates in time-harmonic motion by the diaphragms at resonance frequency thereof to cause a synthesized jet stream);** and first control means **(as constituted by a**

control system--Col. 4, lines 29-34 which controls vibration) for controlling the frequency of the vibration of the vibrator.

Regarding Claim 2, Glezer discloses the gas ejector according to Claim 1, further comprising second control means **(where power supply is wired to piezoelectric actuator for voltage which constitutes amplitude control--Col. 6, lines 37-44)** for controlling the amplitude of the vibrator.

Regarding Claim 21 Glezer discloses the gas ejector according to Claim 1, wherein the respective ejecting sections include a housing including a plurality of chambers partitioned **(where the ejecting section includes a housing as depicted by Fig. 7, and further includes chambers 173 and 174----Col. 13, lines 45-67--Col. 14, lines 1-6 discloses the chambers are sealed except for a series of orifices for air)** by the vibrator such that the chambers adapted for ejecting the gas have substantially the same volume as each other **(as depicted by Fig. 7).**

Regarding Claim 22 Glezer discloses the gas ejector according to Claim 1, wherein the respective ejecting sections include a housing including a plurality of chambers partitioned **(where the ejecting section includes a housing as depicted by Fig. 7, and further includes chambers 173 and 174----Col. 13, lines 45-67--Col. 14, lines 1-6 discloses the chambers are sealed except for a series of orifices for air)** by the

vibrator and adapted for ejecting the gas; and an actuator (**where 57-Fig. 2A is located outside housing)** arranged outside the housing and adapted for driving the vibrator.

Regarding Claim 25, the method steps are necessitated by the already disclosed structure of Glezer.

4. **Claims 11-12,** are rejected under 35 U.S.C. 103(a) as being unpatentable over **(Glezer 6,588,497).**

Regarding Claim 11 Glezer discloses the gas ejector according to Claim 1, wherein the vibrator has a surface extending substantially orthogonal to the direction of vibration thereof, and the area of the surface is in the range from 1,500 (mm2) to 70,000 (mm2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the surface area in the range from 1,500 (mm2) to 70,000 (mm2) since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding Claim 12 Glezer discloses the gas ejector according to Claim 11, wherein the area of the surface of the vibrator is not smaller than 2,000 (mm2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the surface area of the vibrator not smaller than 2,000 (mm2) since it has been

held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 3-6, 15-17, and 19,** are rejected under 35 U.S.C. 103(a) as being unpatentable over **(Glezer 6,588,497)** as applied to claim 1 above, in view of **(Ziada 5,798,465).**

Regarding Claims 3-6, Glezer discloses the gas ejector according to Claim 1, **except** explicitly disclosing wherein the vibrator has the lowest resonant frequency not higher than 200 (Hz) or 150 (Hz) or 100 (Hz) or 35 (Hz). However, **Ziada** discloses wherein the vibrator has the lowest resonant frequency not higher than 200 (Hz) or 150 (Hz) or 100 (Hz) or 35 (Hz) **(as set forth by col. 10, lines 11-32).** It would have been obvious to one having ordinary skill in the art at the time that the invention was made to provide the gas ejector of Glezer with the vibrator frequency of Ziada in order to allow for strong damping of vibratory noise.

Regarding Claims 15-16 Glezer discloses the gas ejector according to Claim 1, wherein a thermal resistance of the region between a heater **(as constituted by thermal wall 139 between heater 134-Fig. 5),** to which the gas ejected from the respective ejecting sections is supplied, and gas surrounding the heater is not greater than 0.7 (K/W) **(col. 1, lines 20-30---where thermal resistance is disclosed as about 0.4 (K/W), Except, Glezer** does not explicitly disclose a noise level at a position about 1 (m) away from the sound source of the sound waves is not higher than 25 (dBA) or 30 (dBA). However, **Zaida** teaches that it is known to damping noise by more than 30dB **as set forth by col. 10, lines 10-32,** and thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the noise level at a position about 1(m) away from the sound source since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding Claim 17 Glezer discloses the already modified the gas ejector according to Claim 16, wherein an envelope volume **(space defined within 162-Fig. 7)** containing the respective ejecting sections and the heater, **except** explicitly disclosing the envelope is not greater than 250 (cm3). However, it would have been an obvious matter of design choice to modify the envelope size not greater than 250 (cm3), since such a modification would have involved vary the volume within 25 0(cm3) since a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

Regarding Claim 19 Glezer discloses the gas ejector according to Claim 1, wherein a thermal resistance of the region between a heater **(as constituted by thermal wall 139**

between heater 134-Fig. 5), to which the gas ejected from the respective ejecting sections is supplied, and gas surrounding the heater is not greater than 0.5 (K/W) **(col. 1, lines 20-30---where thermal resistance is disclosed as about 0.4 (K/W),** wherein an envelope volume **(space defined within 162-Fig. 7)** containing the respective ejecting sections and the heater. **Except, Glezer** does not explicitly disclose a noise level at a position about 1 (m) away from the sound source of the sound waves is not higher than 25 (dBA) or 30 (dBA); the envelope is not greater than 500 (cm3). However, **Zaida** teaches that it is known to damping noise by more than 30dB **as set forth by col. 10, lines 10-32,** and thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the noise level at a position about 1(m) away from the sound source since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. It would have been an obvious matter of design choice to modify the envelope size not greater than 500 (cm3), since such a modification would have involved vary the volume within 25 0(cm3) since a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

7. **Claims 7-10,** are rejected under 35 U.S.C. 103(a) as being unpatentable over **(Glezer 6,588,497)** as applied to claim 2 above, in view of **(Ziada 5,798,465)** and further in view of **(Scher 7,282,837).**

Regarding Claims 7, 9, Glezer discloses the gas ejector according to Claim 2, wherein the vibrator has a surface extending substantially orthogonal to the direction of vibration

thereof **(where an orthogonal surface is depicted by Fig.'s 8-9). Except, Glezer** does not explicitly disclose when the area of the surface is not greater than 70,000 (mm2), the first control means controls the frequency so as not to be higher than 100 (Hz), and the second control means controls the amplitude so as to be in the range from 1 (mm) to 3 (mm). However, **Ziada** discloses wherein the vibrator has the lowest resonant frequency not higher than 100 (Hz) **(as set forth by col. 10, lines 10-32).** It would have been obvious to one having ordinary skill in the art at the time that the invention was made to provide the gas ejector of Glezer with the vibrator frequency of Ziada in order to allow for strong damping of vibratory noise. However, **Scher** discloses a vibrator has a surface extending substantially orthogonal to the direction of vibration thereof **(as depicted by 100a-Fig. 4, where 400 is orthogonal).** It would have been obvious to one having ordinary skill in the art at the time that the invention was made to provide the modified gas ejector of Glezer and Ziada with the orthogonal surface of Scher in order to allow for desired frequencies not likely to cause audible noise. It would have been further obvious to one having ordinary skill in the art at the time the invention was made to provide a surface area of not more than 70,000 (mm2), since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding Claims 8, 10 Glezer discloses the gas ejector according to Claim 7, **except** explicitly wherein the second control means controls the amplitude so as to be in the range from 1.5 (mm) to 3 (mm) or 2 (mm) to 5 (mm). However, it would have been

obvious to one having ordinary skill in the art at the time the invention was made to range from 1.5 (mm) to 3 (mm) or 2 (mm) to 5 (mm) since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

8. **Claims 13-14, 18, 20, and 23**, are rejected under 35 U.S.C. 103(a) as being unpatentable over **(Glezer 6,588,497)** as applied to claims 1 or 2 above, in view of **(Scher 7,282,837).**

Regarding Claim 13 Glezer discloses the gas ejector according to Claim 2, wherein when the frequency driven by the first control means **(as already set forth),** the amplitude driven by the second control means **(as already set forth)**. **Except, Glezer** does not explicitly disclose the vibrator has a surface extending substantially orthogonal to the direction of vibration thereof, and the area of the surface are respectively defined by A (Hz), B (mm), and C (mm2), the value of A x B x C is given in the range from 100,000 (mm3/s) to 10,000,000 (mm3/s). However, **Scher** discloses a vibrator has a surface extending substantially orthogonal to the direction of vibration thereof **(as depicted by 100a-Fig. 4, where 400 is orthogonal).** It would have been obvious to one having ordinary skill in the art at the time that the invention was made to provide the gas ejector of Glezer with the orthogonal surface of Scher in order to allow for desired frequencies not likely to cause audible noise. It would have been further obvious to one having ordinary skill in the art at the time the invention was made to vary A, B, and C for a surface area range between 100,000 (mm3/s) to 10,000,000 (mm3/s), since it has

been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding Claim 14 Glezer discloses the gas ejector according to Claim 13, **except** explicitly wherein the value of A x B x C is smaller than 200,000 (mm3/s). However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the value of A x B x C smaller than 200,000 (mm3/s) since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding Claim 18 Glezer discloses the gas ejector according to Claim 1, **except,** explicitly wherein the vibrator has an approximately symmetrical shape with respect to a plane extending orthogonal to the direction of vibration thereof. However, **Scher** discloses a vibrator has a surface extending substantially orthogonal to the direction of vibration thereof **(as depicted by 100a-Fig. 4, where 400 is orthogonal).** It would have been obvious to one having ordinary skill in the art at the time that the invention was made to provide the gas ejector of Glezer with the orthogonal surface of Scher in order to allow for desired frequencies not likely to cause audible noise.

Regarding Claim 20 Glezer discloses the gas ejector according to Claim 1, **except** explicitly wherein the vibrator includes a first vibrator having a surface extending orthogonal to the direction of vibration thereof and an asymmetrical shape with respect

to the surface and a second vibrator having substantially the same shape as that of the first vibrator and arranged so as to vibrate along substantially the same direction as but in an opposite direction to that of the first vibrator. However, **Scher** discloses a vibrator includes a first vibrator having a surface **(where 400-Fig. 4 is orthogonal)** extending orthogonal to the direction of vibration thereof and an asymmetrical shape with respect to the surface **(as depicted by 100a-Fig. 4);** and a second vibrator **(as depicted by Fig. 5, where a second vibrator of the same shape is shown being opposite to and vibrating in the same direction)** having substantially the same shape as that of the first vibrator and arranged so as to vibrate along substantially the same direction as but in an opposite direction to that of the first vibrator. It would have been obvious to one having ordinary skill in the art at the time that the invention was made to provide the gas ejector of Glezer with the respective vibrators configurations of Scher in order to allow sufficient cooling of a desired area at frequencies not likely to cause audible noise.

Regarding Claim 23 Glezer discloses the gas ejector according to Claim 22, wherein the housing has a bore section **(as further depicted by Fig. 8)** extending from the outside thereof to at least one of the chambers, the gas ejector further comprising. **Except, Glezer** does not explicitly disclose a rod extending through the bore section and fixed to the vibrator so as to move integrally with the actuator, and a supporting member provided in the bore section so as to support the rod. **However, Scher** discloses a rod **(802-Fig. 9)** extending through the bore section **(Col. 8, lines 1-5)** and fixed to the vibrator **(Col. 8, lines 28-30)** so as to move integrally with the actuator **(as**

depicted by Fig. 9), and a supporting member provided in the bore section so as to support the rod **(as depicted by Fig. 9).** It would have been obvious to one having ordinary skill in the art at the time that the invention was made to provide the gas ejector of Glezer with the rod configuration of Scher in order to allow for directional airflow and thus a more improved cooling.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6308740 B1	Smith; Brian R. et al.	Fig. 6B
US 4753579 A	Murphy; Donald	Fig.'s 1 & 10

Any inquiry concerning this communication or earlier communications from the examiner should be directed to COURTNEY SMITH whose telephone number is (571)272-9094. The examiner can normally be reached on M-F 7:30 am-5 pm (1st Fri. off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayprakash Gandhi can be reached on 571-272-3740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. S./
Examiner, Art Unit 2835

/Jayprakash N Gandhi/

Supervisory Patent Examiner, Art Unit 2835